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ABSTRACT

The Goals 2000 is a national effort to improve education in American schools so students can compete with other students throughout the world. This report is the District of Columbia's translation of the national initiative reflecting its efforts to improve student education that addresses the Goals 2000 objectives. It incorporates input from the working groups and ideas from the local community and from current research on educational reform and facility design. The report's focus and organization is on the seven goals outlined in DC Goals 2000; the interface between educational programs and school facilities. It discusses each goal and the recommendations pertinent to how facility related standards or improvements can support the reaching of the goal. Goals examined include the following issues: academic standards and career preparation, staff excellence, school governance and decision-making autonomy, school safety, managements and funding mechanisms for public education, school renovation standards, and family and community involvement. (GR)

District of Columbia Goals 2000

Rebuilding Public School Facilities to 21st Century Standards

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Interim Report
Goals 2000 State Panel
December 15, 1996

revised January 31, 1997
second revision May 7, 1997

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The DC Goals 2000 Community Plan for Educational Improvement

Goals 2000 is a national effort to improve education so that American students will be able to compete successfully with other students throughout the world. ***The District of Columbia Goals 2000 State Education Plan*** is the local translation of the national initiative, reflecting the local effort to improve education so that students in the District of Columbia can successfully compete with students nationwide and worldwide. The ***Goals 2000 State Education Plan*** is community-based and multi-faceted.

While most of the emphasis is placed on educational reform, the panel responsible for creating the plan recognized that the delivery of education in the District of Columbia is often hampered by poor school facilities. Recent examples have had a direct impact on the delivery of educational programs:

- In 1994 and 1995, the start of the school year was delayed due to fire code violations. In 1996 several schools did not open on schedule due to fire code violations.
- Of 157 operating schools, 90 have roofs that leak; 149 require repair.
- During the 1995-96 school year, two schools were closed suddenly when their boilers failed.
- At the beginning of the 1996-97 school year, nine schools had boilers that were condemned by DC boiler inspectors; another 22 schools had boilers that failed inspection. Some schools are heated using rented boilers, which is a costly and inefficient, though necessary, means of providing heat.

Behind the headlines and notoriety, more subtle but no less serious problems exist:

- No schools fully comply with the Americans with Disabilities Act.
- Few middle, junior and senior high schools have science labs suitable for hands-on, real-world science activities.
- Many elementary schools built prior to WWII lack fundamental facilities such as library/media centers or satellite kitchens to warm trucked-in food.
- Some large elementary schools built during the energy crisis of the 1970s warehouse students in oversized and underutilized buildings with little or no daylighting.

Many local school communities are committed to educational reform, but struggle to implement good programs in unsuitable buildings:

- Academies or houses try to carve out an identity within larger facilities;
- Schools purchase and install computers and electronic communications equipment with inadequate power systems and phone lines.
- Middle schools with an interdisciplinary organization try to fit into departmentalized junior high school buildings; or
- Successful early childhood programs expand into too-small or ill-equipped classrooms.

Goal VI of the Goals 2000: Rebuild Public Schools to 21st Century Standards

In framing Goal VI of the ***Goals 2000 State Education Plan***, the education community recognized that facilities must support 21st century teaching practices and meet modern building codes if all of our students are to succeed. The first task listed under Goal VI is the preparation of a comprehensive educational facilities master plan. The mandated master plan was prepared by the new DCPS

facilities management staff. One essential component missing from the system's master planning effort is the link between educational programming and facilities programming. This Interim Report was mandated by the Council in an October Resolution to provide the link between educational program goals and facility programming.[1]

This report incorporates input from the Goals 2000 working groups as well as ideas from the local community and from current research on educational reform and educational facility design. This represents the second revision, and incorporates more research and additional comments from reviewers. Emphasis has been placed on Goals I and VI. There should be ongoing review, revision, and expansion of the recommendations developed in this document.

GOAL IV: Rebuild public schools to 21st century standards

Schools in the 21st century will reflect an evolution in teaching and learning approaches, changes in technology, and inclusion of a diverse group of learners within the classroom. The notion of the school itself has changed so that many students participate in learning activities outside the walls of the traditional school. Outside resources can be brought into a school electronically. Teachers are facilitators of learning in addition to instillers of knowledge.

Content is often framed in interdisciplinary problem solving, engaging students in real-world challenges. In addition to these changes in education, the DCPS faces the same challenges confronting all of today's urban school systems: the need for secure and safe learning environments, the limitations of existing school sites, the high rates of poverty, student mobility and the need for a safety net of social and health services to serve school communities.

All of these trends have implications for the design of school facilities. How can our existing inventory of buildings be transformed into 21st century schools? In many cases our existing structures can be nudged toward the future. In other cases, replacement may be called for. It is not within the scope of the current document to assess the feasibility of transforming of specific facilities. It is rather to begin to envision a 21st century school system and to outline the architecture required to support it. We have articulated a degree of flexibility wherever possible in order to maximize the value of the public investment represented by our existing facilities, but our vision is based on authentic teaching and learning issues rather than on the perceived limitations posed by existing conditions. To seek to do less than providing safe and appropriate space to house our students into the next century is to fall short of the Goals 2000 promise and to fail the students we aim to serve.

Report Organization

This document is organized according to the seven goals outlined in DC Goals 2000. The focus is on the interface between educational programs and school facilities. After each goal, there is a

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[1]District of Columbia Council Resolution, October , 1996.

discussion and then recommendations pertinent to how facility related standards or improvements can support the reaching of the goal. There are many elements to each of these goals which do not involve facilities. These are being developed by different working groups and by various divisions within DCPS and are not a subject of this report.

Goal I: Ensure that all students reach high standards of academic achievement, career preparation and citizenship.

A. Elementary Programs

Discussion

Following are educational issues at the elementary level that challenge our existing facilities:

- Full-day pre-kindergarten is widely available throughout the system; although it is not required, it is a successful program with waiting lists. Its expansion is desirable and requires dedicated space;
- Head start exists or is desired at many sites; it is another successful program that should be expanded, especially at elementary schools with high rates of poverty;
- Early childhood programs require larger teaching stations than typical elementary classrooms;
- Hands-on learning calls for learning centers (and therefore larger classrooms), sinks, storage, and computers in elementary classrooms. All aspects of the programs must be accessible to disabled students.
- Special ed students should be educated in their neighborhood schools or schools of their choice, with an emphasis on receiving those services in the least restrictive environment for each of those students. This will allow each special education student to develop and learn to their maximum potential, while promoting the interaction and integration of those students with their non-disabled peers. Every school in the District needs modifications to meet the requirements of the Americans with Disabilities Act, as well as Section 504 of the 1973 Rehabilitation Act, in order to make this possible.
- Elementary science curriculum requires the active participation of students in both long- and short term projects and activities. Science is best learned when integrated into the curriculum; therefore classrooms should support the demands of hands-on science. Dedicated science classrooms are desirable only where science teachers with specialized training are assigned and only where that model has the full commitment of the school.
- Many DCPS elementary school buildings lack adequate support space and resource space.
- Research cites daylighting as a factor in human well-being; some 1970s era schools lack visual access to the outdoors.
- Research supports the operation of small schools (600 students or less);
- Smallest schools (less than 200 students) lack fundamental program elements and necessary facilities.
- Schools lack the infrastructure and equipment to integrate technology into the learning process.

- Many schools lack even the most basic facilities for school nurses and other health programs.

Recommendations for elementary schools:

1. Head Start, Pre-Kindergarten, and Kindergarten teaching stations:
   An early childhood (Head Start through kindergarten) classroom should be between 1000 and 1200 square feet in size.
   It should have the following amenities:
   - Access to at least one toilet room (two are desirable; at least one must be accessible to persons with disabilities). Toilet room should be within the teaching station or shared by no more than two classrooms. Easy supervision is essential.
   - At least one sink; preferably two at different heights; at least one sink at appropriate height with necessary clearance for wheelchair-user.
   - 4 computers, with required clearance for access by wheel chair users.
   - A resting area (can double for other uses).
   - Dedicated storage.
   - Support space with refrigerator and stove can be shared by two classrooms.

2. First through fifth grade:
   Classroom size:
   900 square feet for first grade;
   850 square feet 2nd-6th grade;
   - Amenities are the same as for early childhood classrooms, except that no rest area is needed, and toilet rooms can be nearby gang toilets with accessible stalls and other features in accord with ADAAG.
   - If open plan teaching stations are deemed to be appropriate educationally, smaller classrooms may be acceptable where they exist, provided that dedicated activity space is nearby; the average area should remain as described above, even if distributed into classrooms and activity areas. Open plan schools should be broadly evaluated in accord with recommendations in this report under Goal IV section D.

3. Area per student should be programmed as follows:
   - 100-399 students = 100 net square feet per student; = ± 143 gross square feet per student at an assumed 70% efficiency;[2]
   - 400-599 students = 95 net square feet per student; = ± 136 gross square feet per student at an assumed 70% efficiency;
   - 600+ students = 90 net square feet per student; = ± 129 gross square feet per student at an assumed 70% efficiency. Enrollments over 600 exceeds the recommended size for elementary schools.
   - Special education students may require additional area to house specialized and space-intensive programs; allow up to 200 gross square feet per student, or adjust

[2]See Goal VI for discussion of area/student formulas and net-to-gross ranges for typical DCPS facilities.

as needed to fit specific program requirements. See discussion under Goal I section D, below.

4. The optimal school size for elementary programs is between 300 and 600 students.[3] Schools should have at least two full classes per grade from pre-k through 5th grade in order to achieve efficiencies of scale and to maximize program offerings.

5. Head Start should be added where the need is demonstrated and there is a commitment to funding operating costs into the future.

6. Consider lowering student:teacher ratio at the lowest performing schools where the percentage of poor children is high. Studies have shown this to be a very effective method of improving student performance[4]. This has space and cost implications for school facilities and operations, but since the DCPS has the space for smaller (and therefore more) classes, it is not as expensive a proposition as in many jurisdictions.

7. Provide at least 400 square feet per school for a health suite, with a private resting area for two cots, secure storage room, desk and chair, and an accessible toilet room. This suite should be adjacent to and visible from the main office, so that it can be supervised when an itinerant nurse is not on-site.

B. Middle schools

Discussion

The DCPS has adopted a "middle school" approach to educating early adolescents, although the transition from a system of junior highs is not complete. Middle schools address the unique developmental needs of pre-adolescent and adolescent children. Students, teachers, and facilities are organized into teams and where students identify with a smaller group, and where they are better known by the adult staff. Teachers form an interdisciplinary team and work together to engage the whole child in learning. Teams of teachers may work with the same students for three years. Each team inhabits a distinct portion of the school facility. There may be one, two or three teams of 100 to 150 students per house. Three houses, usually identified by grade level, make up a typical middle school. Core spaces, such as cafeteria, art, music and gymnasium, are shared by

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[3]Kathleen Cotton. ***Affective and Social Benefits of Small-Scale Schooling.*** (ERIC Digest. 1996) EDO-RC-96-5.;
See also: Conway, George. ***Small Scale and School Culture: The Experience of Private Schools.*** (ERIC Digest. 1994) EDO-RC-94-6.
And: Howley, Craig. ***Ongoing Dilemmas of School Size: A short Story.*** (ERIC Digest. 1996) EDO-RC-96-6.
And: Howley, Craig. ***The Academic Effectiveness of Small-Scale Schooling (An Update).*** (ERIC Digest. 1994) EDO-RC-94-1.

[4]Education Law Center: ***Wiping Out Disadvantages: The Programs and Services Needed To Supplement Regular Education For Poor School Children*** (Education Law Center. Newark. 1996). Note that Prince George's County, Maryland, has adopted a program of smaller class size for disadvantaged students. The County's biggest impediment in implementing the program is the availability of space to house students at a lower density.

all houses.

The transformation of District junior high schools into middle schools for 6th, 7th and 8th grade students has not been implemented across the board. Some impediments are:

- Adequate space, staff, and appropriate environment at the high school for ninth grade students;
- Adequate space at the junior/middle to accommodate students in houses and teams;
- Some elementary school communities prefer to retain 6th graders at the elementary school;
- Appropriate building organization to accommodate teams. Optimally, science labs should be located in houses, but this is not necessarily a precondition of transition into middle school format.
- Transferring sixth grade students out of elementary schools and into middle schools may precipitate an earlier exodus of students to private schools in some cases.
- Lack of outdoor play equipment for middle school children.

In addition to these concerns about the middle/junior transition, concerns over the suitability of DCPS middle-level schools as educational environments exist:

- No provision for hands-on science at most middle/junior high schools.
- Lack of infrastructure and equipment for technology in the classroom.
- No systemic provision for technology education.
- Inadequate provision for basic health care services.

Recommendations for middle schools:

1. Comprehensive implementation of middle school organization only when the following preconditions have been met:
   - adequate staff training and curriculum development for middle school programs
   - appropriate social and educational environment for ninth graders at the receiving high schools, including development of ninth grade "houses" where appropriate;
   - educational and physical improvements required to accommodate all students including ninth and 6th graders are undertaken.

2. Area requirement:
   - 200-600 students = 105 net square feet per student; = ± 150 gross square feet per student at an assumed 70% efficiency.
   - 600+ students = 100 net square feet per student; = ± 143 gross square feet per student at an assumed 70% efficiency.
   - Special education students may require additional area to house specialized and space-intensive programs; allow up to 200 gross square feet per student, or adjust as needed to fit specific program requirements. See discussion under Goal I section D, below.

3. Organization:
   Houses are typically identified by grade (6th, 7th, and 8th). Each house is composed of

one to four teams of 100, 125, or 150 students.

4. The maximum enrollment number is more flexible for middle schools than elementary or high schools since students identify primarily with their team and house. A maximum enrollment of 1000 for a single facility is recommended with an optimal enrollment of 600 to 900 students.

5. Science labs are recommended at a minimum rate of one per 125 students. Labs should be located in each interdisciplinary team area. Labs within a house may be grouped together and share support facilities.

6. Each team will have a team activity area for students and a team planning area for teachers.

7. A typical middle school will have a core of shared facilities including art, music, technology education, food and nutrition science, media center, gymnasium, cafeteria and administration.

8. Provide at least 700 square feet per school for a health suite, with an examination area, a private resting area for three or four cots, secure storage room, desk and chair, and an accessible toilet room. This suite should be adjacent to and visible from the main office, so that it can be supervised when an itinerant nurse is not on-site.

C. High Schools

Discussion

The following educational issues at the high school level challenge our existing facilities:

- Programming calls for all students to learn challenging academic content, and for all students to prepare for the world of work.
- Scale and atmosphere:
  Many students fall between the cracks of the large, comprehensive high school. Research tells us that the scale and the attitude of the educational institution has a significant impact on the success of its students.[5]
- Block scheduling is an important strategy in engaging students in active learning.
- Programs must address the needs of students who have been disruptive in the regular high school setting. In situations where students with behavior disorders, neurological disabilities, and other types of disabilities are in classrooms (either mainstream or segregated) and not provided with necessary support services, their behavior can become

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[5]Sizer, Theodore, ***Horace's Compromise: The Dilemma of the American High School***. (Houghton Mifflin Company. New York. 1984), and ***Horace's School: Redesigning the American High School***. (1994).
See also: Roellke, Christopher . ***Curriculum Adequacy and Quality in High Schools Enrolling Fewer Than 400 Pupils (9-12)***. (ERIC Digest. 1996) EDO-RC-96-7
See also: Klonsky, Michael, ***Small Schools: The Numbers Tell a Story*** (The Small Schools Workshop, University of Chicago, revised November 1995).

disruptive to others. Responses include:

- reduced student:teacher ratio
- assignment of classroom aides, accessible materials, and tutoring, etc.
- provision of on-site social services.

Where disruptive behavior is considered to be an issue of discipline, other measures may be appropriate:

- in-school detention and suspension
- creation of alternative schools, including
- possibly a residential school (see Goal IV).

- Technology
- Drop-out prevention.
- Science facilities.
- Technology education and the integration of meaningful career education programs into the comprehensive school.
- Facilitating interdisciplinary learning.

Recommendations for high schools:

1. Creation of houses or academies of no more than 400 students throughout the system. Some academies would be free-standing and develop specialized programs (Banneker Academic, School Without Walls, D. C. Street Academy, etc.) Many experts recognize educational advantages to high schools for as few as 250 students. For very small schools, the advantages must be weighed against the programmatic and economic inefficiencies. Others would be collected together to share existing facilities. The research is not clear on whether the sub school model is as effective as small schools are in improving student well-being and performance. Therefore the sub-school model should not replace small schools, but can be considered as a means to improve the climate at large schools. For example, a comprehensive high school may contain a ninth-grade house. This second approach may, by virtue of the greater efficiency of a larger school, provide a wider variety of certain kinds of activities, such as physical education. Three academies sharing a 1200-student facility could share a main gym, an auxiliary gym, and a dance classroom.

2. All schools will provide a full academic curriculum. All students will also be prepared for the world of work. Many schools will also provide specific career training. Some schools will identify outside resources for provision of career training.[6]

3. Typical classroom: 800 square feet per classroom. Smaller teaching stations such as seminar rooms should be provided to vary the learning environment and allow for specialized technology.

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[6]National Association of Secondary School Principals, ***Breaking Ranks: Changing an American Institution***. (Reston, VA, 1996).

4. Alternative approaches to high school design, such as that proposed by ***A New Vision for the Comprehensive High School***[7] should be tried at a small scale on a pilot basis. Of particular merit are:
   - The creation of student-centered work stations and production areas as the primary unit of capacity rather than the classroom;
   - The creation of smaller sub-schools within a school;
   - The creation of a hierarchy of generic learning spaces, including generic science labs; and
   - The use of the city as a laboratory;

   Each of these ideas pose some logistical challenges that can be evaluated in a pilot.

5. Area requirement:
   - 250-600 students = 110 net square feet per students; = ± 157 gross square feet per student at an assumed 70% efficiency.
   - 600+ students = 105 net square feet per student; = ± 150 gross square feet per student at an assumed rate of 70% efficiency.
   - Special education students may require additional area to house specialized and space-intensive programs; allow up to 200 gross square feet per student, or adjust as needed to fit specific program requirements. See discussion under Goal I section D, below.

6. Media centers will be increasingly important as nodal points to the Internet and as production areas for student multi-media projects. In spite of this, area requirements for media centers may decrease due to reduced reliance on printed media. Books will, however, remain an essential component of education. Access to electronic information will be decentralized throughout the facility and perhaps into students' homes.

7. Provide science labs at a minimum rate of one per 150 students. Distribution of labs should reflect educational philosophy of program. Labs should provide for hands-on activities as well as lecture-type activities. Science labs and other specialized learning spaces must be structured to allow for programmatic access for students with disabilities.

8. All schools should have at least one space outfitted for distance learning. This space can double as a conventional teaching station provided it can be made available to many users throughout the school. Its design and equipment should be aligned with the comprehensive technology plan.

9. Provide at least 900 square feet per school (for a comprehensive high school of 1200 students) for a health suite, with an examination area, a private resting area for four cots, secure storage room, desk and chair, and at least one (preferably two) accessible toilet rooms. This suite should be adjacent to and visible from the main office.

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[7]Copa, George and Pease, Virginia, ***A New Vision for the Comprehensive High School*** (National Center for Research in Vocational Education, University of California at Berkeley, December 1992). Of special interest is ***Appendix J: Learning Environment: An Architectural Interpretation of a New Designs Archetype High School.***

D. Educating Students with Disabilities: Special Education and Programmatic Access

Discussion

The Americans with Disabilities Act is the federal statute most frequently cited in describing the need to modernize D.C. public schools to make the physical environments of each school building accessible for individuals with disabilities. While this is an important reference and a landmark piece of legislation in addressing the rights of individuals with disabilities, particularly in relation to the private sector in this country, the D.C. public school system has been responsible for addressing accessibility issues since the Rehabilitation Act of 1973.

The Individuals with Disabilities Education Act (IDEA), first passed in 1974 as the Education for the Handicapped Act, requires that each student with one or more disabilities, who is in need of special education services, be provided a free and appropriate public education *in the least restrictive environment.* D.C. Public Schools has had significant programmatic problems in meeting this requirement associated with the receipt of federal funds under IDEA, and this is one of the reasons that large number of special education students are being educated in private schools, at a high cost to the D.C. public school system. In addition, the special education students educated within the public schools are most frequently educated in segregated settings, either self-contained classrooms separate from their non-disabled peers, or in separate school buildings, such as Sharpe Health, with few or no opportunities for the interaction with non-disabled peers intended in the interpretation of "least restrictive environment" for most special education students.

IDEA also requires the D.C. public school system to make assertive efforts to employ individuals with disabilities in all aspects of the educational system. Thus, the law does not merely pertain to the physical environments in which students are educated and circulate, bu' to all school and administrative buildings in which district personnel may be employed.

Beyond the application of IDEA, which relates to students with disabilities who need special education, there is another federal statute which was enacted in the same time period as IDEA - the Rehabilitation Act of 1973, which requires that individuals with disabilities have access to programs and services equal to individuals without disabilities. Section 504 of the Rehabilitation Act applies to any entity which receives federal funding (such as school districts) and covers any individual "with a physical or mental impairment which substantially limits one or more major life activity." While IDEA applies to those students who are in need of special education, Section 504 covers all individuals with disabilities, whether or not that disability results, in the case of a student, in a need for special education services.

Title II of the Americans with Disabilities Act is comparable in scope and coverage to the regulations implementing the 1978 amendments to Section 504. The D.C. public school system is therefore not merely charged with removing barriers and making their buildings and programs accessible according to the ADA, which took effect in this decade, but is actually twenty years behind in providing equal access for individuals with disabilities.

Recommendations for Special Education and Access for Persons with Disabilities

1. All schools should fully comply with the Americans with Disabilities Act (ADA). This

should be a high priority, since failure to comply violates federal law and has the potential to deprive individuals of their civil rights. Compliance provides for access not only for special education students with physical disabilities, but for all students, teachers, parents, and other community members with disabilities.

2. The twenty schools slated for a pilot inclusion program put forth by the school system for implementation in September 1997 should provide complete programmatic access and ADA compliance prior to their opening.

3. The model educational specifications to be developed must support the integration of special education students into all schools, in the least restrictive environment for each child. The area formulas provided above are large enough to include adequate space for accessible facilities, and space for both self-contained special education classrooms and resource rooms, and for inclusion in the typical classroom arrangement. Additional square footage may be required in locations where space is to be dedicated to physical therapy or other space-intensive uses. Up to 200 square feet per student in special education may be reasonable where specialized facilities are needed.

4. The school system should establish and maintain a list of accessible buildings for community meetings, public hearings, and other school-related gatherings. Meetings should be held only at those sites where all can be accommodated. As school buildings are brought into compliance with the law, the list should be expanded.

E. Technology

All District of Columbia Public School facilities should meet minimum standards set forth in the Goals 2000 State Educational Technology Plan, presented to the U. S. Department of Education on July 9, 1996. Technology infrastructure should be linked to teacher training, curriculum development, hardware and software purchases, and electrical improvements. No single aspect of the plan can succeed without the others.

Goal II: Provide competent, well-trained and caring staff.

Discussion:

Teachers are skilled professionals who will do their best work in well-thought out and well-maintained school facilities that respond to their needs and support their instructional activities.

Recommendations:

All schools will provide the following spaces and capabilities to support teaching staff:

1. A teacher's lounge with kitchenette, table(s) and chairs, and phone. An adults only toilet room should be adjacent.

2. One or more teacher preparation room(s) with phone, computers, supply storage, copying equipment, and furniture for working individually or in groups. Provision for teacher planning should reflect the curriculum organization; for example, a middle school house should provide planning for each interdisciplinary team. For schools where teachers float,

provide 50 square feet per teacher for planning space. For schools where teachers are permanently assigned to a classroom, provide at least one 500 square foot teacher preparation room per 15 teaching stations.

3. Provide each teacher with access to a phone and voice mail. Each teacher should also have access to a networked computer for educational and administrative purposes. Telephones in the classroom are an essential feature for connecting teachers to the outside world.

Goal III: Restructure school governance by empowering local schools with independent decision-making authority.

Discussion:
Enterprise schools, teacher-led charter schools, public charter schools, and traditional schools operate within the DCPS system with varying degrees of autonomy and explicit levels of accountability. The need for facility standards and policies to assist in space assignation and equitable distribution of resources is clear. The application of the standards, especially where the investment of physical assets and capital funding are concerned, must take place within clearly defined levels of flexibility. Community participation in decisions regarding the Facilities Master Plan, the subsequent capital plans, the development of prototype educational specifications, and individual school improvement projects must be assured.

Recommendations:
1. Develop facilities standards for elementary, middle, and high schools. These standards will be used as a base for preparing educational specifications for individual projects. The standards should be created with input from educators, parents, students and other stakeholders so that they are relevant and broadly accepted. The DCPS must articulate an explicit degree of autonomy at the local school level in preparing educational specifications for modernizations or other improvements. Certain elements may be deemed as requirements by the central administration; other aspects of facility design and use may be allowed greater discretion at the local school level. Both conditions should be explicitly defined. A balance must be struck between local school autonomy on one side and the need to create facilities that can stand the test of time and serve changing needs on the other.

2. Schools should have adequate space for local management responsibilities and shared functions. This can be accommodated within the area per student formulas provided in this document. Educational specifications should identify space for large and small group meetings, files, computer access, adequate telephones, and perhaps additional staff where appropriate. In some cases, such amenities can double for other uses (such as multi-purpose space or auditoriums for large group meetings). In other cases traditional spaces may require a slight expansion to allow for additional work space and/or storage.

Goal IV: Provide safe, orderly and disciplined schools and surrounding communities in which all feel safe and secure.

Discussion:
The school facility should foster security within and around the school so that students, teachers, and staff are safe and feel safe from violence and disruptive behavior. Further, students, teachers and staff should learn, teach and work in an environment free of health and safety hazards.

Recommendations:
A. School climate:

1. Physical improvements to support security at schools should be made to maximize the effectiveness of routine supervisibility wherever possible. Design efforts should be unobtrusive to avoid creation of a prison-like atmosphere.

2. Students will belong to schools of no more than 400 at the high school level, teams of no more than 150 at the middle school level, and schools of no more than 600 at the elementary school level. Where high school facilities have capacity greater than 400 students, academies, schools-within-schools, charter schools or houses can be designed to provide for identification with smaller units. Each school-within a school will have its own administration and guidance counseling so that all students are known by name by the adults at the school.

3. For disruptive students, in-school suspension coupled with appropriate counseling and other services should be supported by the following measures:
   - At secondary schools, an in-school suspension room should be identified.
   - This space should provide ± 35 square feet per student, and be fitted with individual student work areas (carrels). The size of the space and the number of carrels will vary from school to school depending on need.
   - A dedicated toilet room should be adjacent.
   - Counseling offices and offices for itinerant specialists should be located nearby to help in identifying issues and providing help for troubled students.

4. Many service partnerships exist at DC Public Schools. Where effective, these efforts should be supported and, where appropriate, expanded. Facilities for non-school services on-site should be allocated based on local needs. This could include, for example, a child care center for student parents, or expanded health services. In some cases, such as a parent education class, traditional classroom space can double as a community service space after-hours. Where a unique or dedicated space is required, a fair accounting of the value of the space and the cost of any capital or other improvements required must be made. Wherever possible, these improvements should be funded outside of the capital budget for the school system.

5. The school system has been evaluating the concept of a residential school. At the time this interim report is due, no consensus has been reached on the desirability or practicality of such a program. If the school system decides to pursue the creation of a residential

school, its development would likely have a significant capital component.

B. School safety:

1. All schools will meet fire code and comply with ADA.
2. All schools will have full fire sprinkler systems. Sprinklers offer the highest degree of safety to building occupants in the event of fire.
3. At many schools, exterior entrances are difficult to control. All schools will be fitted with electromagnetic door systems linked to the fire alarm system so that exterior doors can remain locked except for during emergencies, and so that interior doors can remain open where desired for ease of supervision. Priority will be given to:
   - secondary schools; and
   - schools where DC police or DCPS security identify concern for crime in surrounding areas.

4. Main offices should be located within school buildings in locations that provide for passive supervision of the main entrance (both interior and exterior). Ample glazing at the outside and corridor walls allows for staff to keep watch over the primary entrances. Secondary entrances which are likely to remain unlocked should be located near continually occupied spaces to allow for passive supervision. In secondary schools, assistant principals, security officers, guidance counselors, or sub-school administrators should be strategically located to supervise wings or other discrete areas.

5. School layout should minimize back hallways and other areas which are difficult to supervise. This is especially important at the secondary level. Where such areas are unavoidable due to existing conditions, they should be monitored electronically from a central location.

C. Healthy schools:

1. All schools will be free of lead, asbestos, and radon hazards.
2. All schools will have adequate ventilation in accord with ASHRAE Standard 62-1989.
3. All renovations to schools will consider indoor air quality both during construction and after renovations are completed. Consideration should be given to:
   - Eliminating use of ceiling plenums for air distribution;
   - Minimizing lined ductwork to those areas where no alternative exists;
   - Specifying only low-VOC emitting materials and finishes in new work and renovations;
   - Using carpet only where it is uniquely appropriate and where a high level of maintenance guarantees its cleanliness, and where replacement can occur in a timely manner.
4. Daylighting has been linked to higher productivity and improved health for building occupants. Consideration should be given to providing both daylighting and views to the outdoors to continually occupied spaces at window-less schools. Priority should be given to elementary school classrooms. New schools and additions should be designed to supply daylighting to most continually-occupied spaces.
5. All schools should provide students with an opportunity for physical education and

exercise. Where appropriate, physical education facilities can be jointly managed by DC Recreation in order to maximize the return on public investment.

D. Restructure open-space schools

Many students have difficulty staying attentive in an open space learning environment. The open space classrooms are not appropriate for many students, such as those who are easily distracted (those with ADD or ADHD, for example), and are not consistent with current teaching practices. Further, open space at the secondary level pose problems with supervision of unoccupied teaching stations. A study should be undertaken to assess our open space buildings and determine what design and construction issues are associated with their improvement. Some issues with open space buildings include:

- The original designs usually lack necessary levels of fresh air now recognized as important to protect occupant health. Poor maintenance of mechanical equipment, frequent roof leaks, and non-ducted air circulation systems exacerbates the indoor air quality problems associated with buildings of this era.
- Problems caused where open space schools have been divided up in an ad hoc fashion, altering original air flow patterns and resulting in poor ventilation as well as code and circulation problems;
- Smaller teaching stations at some schools don't meet current standards;
- Acoustical environments may not be conducive to team teaching, group projects, and simultaneous activities.
- Many open space buildings and additions have few windows. Some have no glazing at all in the teaching areas; others have glazing which is hazed and discolored due to age and deterioration.

In light of these concerns, a detailed study and reassessment of the open space schools in the DCPS inventory should be completed in the next twelve months. Findings should be incorporated into facilities standards, and be a factor in determining the adequacy of existing facilities.

Goal V: Provide effective management and funding mechanisms for public education.

Recommendations:

1. In addition to developing the current Master Plan and Capital Plan for DCPS, the system should develop and publish a policy on planning. The policy would serve as a framework for annual planning cycles. This is vital in order to develop public participation, to increase accountability, to enhance support for the capital program in the educational and tax-paying communities within DC, and ultimately to improve the education of DC public school students. We envision a capital program where school improvements occur in an environment of public awareness with consensus for some of the difficult decisions that may lie ahead; where resources are distributed equitably and accountably, with a transparent decision-making process. While it may be impossible to exorcize politics completely from the capital planning process, its role can be minimized through exposure to public scrutiny.

2. The DCPS should develop support for adequate funding levels for capital improvements

through objective assessment of needs. Two horizons must be considered: (1) the existing condition of DCPS facilities and (2) the condition necessary to provide safe and appropriate learning environments for DCPS students. The difference between the two conditions provides the landscape within which improvements must be framed. While the existing conditions have been extensively studied, the desired outcome condition has not been well defined. Expectations, while varied, tend to be well below national norms. This document is one step in the direction of defining outcomes, but our notion of 21st century schools must continue to be developed through Goals 2000 and in other forums. An annual master planning cycle is one important means to support continued discussion and allow for the evolution of the District of Columbia's vision for our schools.

3. Coordinate physical improvements with educational programs, so that investment in facilities responds to authentic educational practices and will yield maximum benefit to students. For example, technology can only be effectively delivered to students where teacher training, software, hardware and infrastructure improvements [cabling for VVD and power, etc.] are coordinated. See the Goals 2000 Technology Plan for more information.

4. Make full use of public and private resources within the District of Columbia. For example, students attending schools located adjacent to mass transit benefit from the public investment in mass transit infrastructure. This has value for schools of all levels, but especially for secondary education programs. Mass transit makes school choice viable for many families. Other examples include the many partnerships between federal agencies and DC Public Schools, such as the partnership between the Smithsonian and Capital Hill cluster schools.

5. It is tempting but short-sighted to see the DCPS facility needs in terms of building component replacements. There are several reasons to avoid this approach. First, in an adequately funded and managed program, component replacements will occur on a life cycle basis. For example, each roof will be replaced when it has exceeded its useful life. Currently, however, the past deferral of roof replacements has created a backlog of work, where a majority of the system's roofs require replacement. Some serious catching up is needed, but a state of routine life cycle replacements is the "equilibrium" condition to be targeted. Second, component replacements seldom address educational needs. There is a tendency to see a school building as a set of systems (exterior envelope, heating plant, fire safety systems, interior finishes) rather than as a place housing people engaged in educational activities.

Third, a component approach is less efficient and ultimately more expensive than a modernization approach, if the desired outcome is a safe and educationally appropriate building inventory. While this may seem counter-intuitive at first, a review of some real-world examples will illustrate the rationale.

For the first example, consider a door replacement project. If old non-rated wooden doors are replaced in order to comply with fire code, one problem is addressed by a simply replacing the

old door with a labeled, rated door. If, however, the door openings are widened to comply with BOCA and ADA requirements, while providing the rated door, then three issues are addressed simultaneously. If a magnetic hold-open system is installed on the door, then a fourth issue is addressed; this issue has implications for education delivery and building supervision by allowing doors to stay open when teachers desire. If a fire suppression system (sprinkler system) is added to the subject school building, then the doors may no longer be needed in the location in question. But one cannot make the determination of whether the doors are necessary or not unless the program issues are understood as well as the code issues. By broadening the scope of the project, solutions which solve overlapping problems can be identified.

A second example involves heating, ventilating, and air conditioning (HVAC) systems. Indoor air quality (IAQ) is emerging as an issue at several of the DCPS open space schools. If the school system undertakes a chiller replacement at an open plan school, some minimal IAQ improvement might derive from the installation of more reliable equipment. If the school system defines the problem as an HVAC upgrade, however, improved ventilation rates can be achieved by redesigning the mechanical system This will improve IAQ better than the chiller replacement alone. If the work is done within the context of a modernization, however, then the issues related to the educational efficacy of the open-space layout can be addressed in the project, and all issues can be resolved simultaneously and cost-effectively. This improves IAQ *and* delivery of educational programming. While the modernization certainly costs more than the chiller replacement alone, it costs less than handling each issue as separate element. In fact, it is the only framework that *can* address all of the issues. None can be adequately resolved without reference to the others.

The DCPS component approach has made some sense in responding to the current crisis. The danger lies in accepting a program of component replacements as a *modernization* program, or in postponing modernizations into the master plan's out years. As illustrated above, a component approach, by its nature, excludes comprehensive solutions to interrelated problems. It excludes the conception of a school as a place of learning first and foremost. It disallows thinking outside of the conventional box about creative solutions to educational needs. In fact, a component replacement approach tends to exclude most education-related capital improvements from ever reaching students.

Goal VI: Rebuild public school facilities to 21st century standards.

Recommendations:

1. A model educational specification (ed spec) should be developed for each type of school facility anticipated in the master plan. This model ed spec will expand and refine architectural and engineering requirements for various programmatic types. Each ed spec should be developed with broad input from teachers, principals, maintenance staff, parents, and community people as well as experts in school facility design. A degree of flexibility must be articulted for each aspect of the model in order to allow for adaptation of existing facilities to the extent feasible and to allow for local school autonomy.

2. Use area standards to establish equity across the system and to budget for capital projects.

The DCPS school buildings vary widely in the functions they support. Levels of efficiency in delivering program also varies considerably. For this reason the area formulas provided in this document are given in net and gross units. Gross area per student should be used for macro-scale planning. At the individual project level, use of net area rather than gross will better support programmatic equity by factoring out the differences due to age, design styles, and resulting levels of efficiency.

There are no national standards for area per student in school planning. Local and regional variations are significant. Areas provided are about 10% higher than some regional averages in consideration of the following factors:

- The DCPS building inventory is already in place, thereby eliminating the primary source of pressure to reduce area per student which systems with expanding enrollments face;
- The somewhat more generous area per student compensates for inefficiencies in adapting existing facilities to modern educational programs;
- The high percentage of disadvantaged students in the DCPS system requires a higher ratio of teachers to students and more support services, thereby reducing optimal density;
- A higher area per student now will allow for some contraction of the area allowance if the system's enrollment grows in the future.
- Changes in delivery of educational programs point toward a higher area per student: space for hands-on activities in every teaching station and space for computers stress classrooms of 700 square feet.
- ADA requirements have been estimated to add 5% to the area required for a typical school.

3. The Master Plan process should make the transition from component replacement projects toward comprehensive modernization projects. While component replacements will remain an ongoing aspect of the program, its fraction of the total capital budget should be gradually reduced to no more than 25% of the total budget. The goal of 25% for component replacement could be met within three years providing adequate levels of funding for capital improvements are realized. The transition allows a long lead time for multiple modernizations to come on line, reflecting the increased planning time demanded by comprehensive projects.

4. Where replacement is thought to be more cost-effective than modernization, The DCPS should undertake a feasibility study to determine whether to modernize or replace a school building. Feasibility studies should compare modernization and new construction and quantify and qualify the following factors:

- Cost of complying with the standard proposed in the educational specification, which includes code and ADA compliance;
- Advantages and disadvantages of either version, including historicity of original building and architectural importance in community, net and gross area for each option, and efficiency;
- Shortcomings in either approach;
- Site design issues;
- Energy costs for 10 years;

- Maintenance costs for 10 years;
- Schedule and phasing requirements for both versions;
- Bottom line costs;
- Other factors that contribute to the decision-making process

Intermediate solutions, such as partial demolition c mbined with expansion often provide the optimal solutions. These should be explored in the feasibility study. Copies of the feasibility study should be made available to the Local School Restructuring Team, the local Advisory Neighbhorhood Commission, and the local PTA.

5. Capacity assessments should be based on explicit criteria.
   Following is a proposed Capacity and Space Formula Policy:

   A. DCPS-RATED CAPACITY
      The DCPS-Rated Capacity is defined as the maximum number of students that resaonably can be accommodated in a facility without significantly hampering delivery of the educational program.

It is not intended to be a standard of what class sizes should be, but rather to reflect typical staffing patterns. It is, however, one criteria used in evaluating whether a particular school is overcrowded such that relief is needed and provision of additional space may be warranted. Other criteria are area per student formula and correspondence of a given school with standard educational specifications to be developed.

(1) The following formula shall be used to deterimine the DCPS Rated Capacity of existing facilities:

a. Elementary schools and middle schools (for pupils in grades pre-K through 8th inclusive)
The DCPS Rated Capacity is derived through multiplying the number of classrooms by the DCPS approved capacity:

Prekindergarten classrooms	x 20
Kindergarten classrooms	x 22

B. DESIGN CAPACITY

1. Design Capacity is used to establish the maximum gross area allowance of a school building eligible forcapital program funding purposes. Design capacity is the product of projected enrollment and a utilization factor. The projected enrollment is the number of students expected to attend the school five years after the project is approved for planning.

2. Design Capacity is calculated as follows:

a. Elementary Schools (including prekindergarten, kindergarten and special education students); Middle Schools; and Career Technology Schools and Centers

FULL-TIME EQUIVALENT ENROLLMENT (FIVE-YEAR PROJECTION) X 1.0

b. Secondary Schools (including middle, junior high, and senior high schools, with special education)

FULL-TIME EQUIVALENT ENROLLMENT X 1.1

C. JUSTIFICATION FOR MODERNIZATION PROJECTS

The following criteria are recommened for identifying schools for comprehensive modernization:

1. The school must be slated for continued use as a DC Public School;

2. Overall need: All schools should be compared to the standard educational specification to be developed, and to a condition of good repair outlined in the facility assessment (updated as necessary). If a school is determined to be a necessary part of the the DCPS school building inventory, but its existing condition shows a high deviation from the norms developed in the standard educational specification relative to other schools, it should be considered for modernization. These can be ranked by comparing the percentage of a modernization that is needed to correct deficiencies. Further, if a school is a high priority for two component replacements, and at least one is critical, it should be given priority status.

3. Receiving schools: Of those schools ranked highest by the method outlined above, if a school is slated to receive students from a closing facility, the receiving school should be considered a priority for modernization.

4. Community need: If a school meets the criteria set forth in items one and two, and is in an enterprise zone or houses children who are at above 80% free and reduced cost for lunch, such a school should be weighted for priority consideration.

5. An existing school facility shall be considered as overutilized or overcrowded when the current or projected enrollment reaches and/or exceeds the DCPS Rated Capacity. Enrollment in excess of the DCPS Rated Capacity can justify a new school or an increase in capacity at an existing school. In general, enrollment should be within boundary for the subject school, where a boundary adjustment with adjacent school(s) cannot be made. Exceptions are

for city-wide schools, providing the enrollment does not exceed the recommended maximums contained in this document. City-wide schools that are over capacity and at or above the recommended maximum enrollment for their program type should be considered for replication rather than expanded enrollment.

The establishment of explicit factors for prioritization is essential to restoring public confidence in the planning process. The factors outlined above represent no more than a first take on the prioritization of projects. Given the severely limited resources available to undertake capital improvements, this issue is destined to be a difficult one. Much more community input is needed. (See Conclusions, below)

Goal VII: Increase family and community involvement in education.

- Provide space at schools for parent volunteers.
- Zone schools for community access while preserving an educational atmosphere and safe environment.
- Partner with other agencies: create new partnerships and enhance existing ones. Where other agencies use dedicated DCPS space, policy must address accounting for such space, payment guidelines where appropriate, and relation to schools' area per student allowance.
- Develop schools as community hubs.
- Provide for public participation during master plan and capital plan development, standards development, and on local school educational specifications planning committees.

Conclusion:

This interim report is intended to serve the immediate needs of the school system and other stakeholders in developing the Comprehensive Educational Facilities Master Plan. It is also hoped that this report will prompt broad discussion in the educational community in particular and in the public arena in general about a vision for the District of Columbia's Public Schools. Toward this end, we ask all readers to send comments to the Goals 2000 working group for Goal VI, care of the 21st Century School Fund.